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OBSERVATIONS

ON THE
CAUSES OF DISTORTIONS
OF THE
LEGS OF CHILDREN,

AND THE
CONSEQUENCES OF THE PERNICIOUS MEANS GENERALLY USED WITH THE INTENTION OF CURING THEM; WITH CASES TO PROVE THE EFFICACY OF A METHOD OF CURE INVENTED AND PRACTISED ONLY

By, T. SHELDRAKE, *K*

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L O N D O N:

Printed for Messrs. EGERTON, facing the Admiralty; HOOKHAM and CARPENTER, New Bond-street; LEWIS, Russell-street; MURRAY, Fleet-street; DILLY, in the Poultry; and sold at the Author's House, No. 50, Strand.

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CAVES OF DISTORTION

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A circular museum stamp with the word "MUSEUM" in the center. The text "MUSEUM" is in a bold, serif font. Below it, in a smaller font, is "MUSEUM OF THE CITY OF NEW YORK". The stamp is slightly faded and has a textured appearance.

1960

THEY WERE NOT IN THE AREA AT THE TIME OF THE SHOOTING.



TO THE PUBLIC.

THE profession, in which I have passed my life, having afforded me many opportunities of seeing that those diseases which require mechanical assistance are often improperly, and, more frequently, inadequately treated; and the opportunities I have had of acquiring information on such subjects, having given me the means of making important improvements in several parts of my art, few apologies can be necessary for publishing an account of what I have proved to be of superior utility in the treatment of such diseases as have come under my observation. The following pages relate to diseases which have either been abandoned as incurable, or, generally, left to the care of quacks or nurses; and, in consequence, there are few who do not know, and none who have

not seen many instances of persons, who have become cripples from mismanagement or neglect.

THE cases are few, but remarkable on account of the success with which they were treated: for that success, I have endeavoured to account by explaining the principles on which that treatment was founded, in hopes that this publication may be the means of preserving others from the effects of similar diseases: from the known liberality with which every improvement is received, I feel a confidence, that this will meet with all the encouragement it shall be found to merit.

UPON the same principle, I presume to hope, that any inaccuracy it may be found to contain will be excused, when it is stated to be written in the midst of the exertions of an active profession, which scarcely

leaves leisure enough for literary correctness; that this indulgence will easily be granted by the candid I have no doubt, and the opinions of those of a different description, I shall never think deserving notice.

T. SHELDRAKE.

No. 50, Strand.

PLATE

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published by T. SHELDON & CO.
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PLATE I.

Three views of a club-foot, shewing the original state of the disease before any attempts were made to relieve it. The patient 23 days old. See Case 1. p. 26.

PLATE II.

Three views of the same foot placed in the same points of view as when the preceding drawings were taken : these drawings were made immediately after I cured the feet, exactly three months from the time they were taken in hand.

PLATE III.

Three views of an adult club-foot ; this patient had successively been trusted to the care of every person who would undertake his cure, from the time of his birth till he arrived at maturity. By comparing this with the two preceding plates, some estimate may be formed of the comparative efficacy of the method of treatment recommended in this work, and what had been previously known. See Case 4. p. 43.

PLATE IV.

A back and front view of a subject in my possession, shewing the curvature of the leg-bones, and its consequences. See p. 50.

PLATE I.

Three views of a club-foot, showing the original
state of the disease before any attempts were
made to relieve it. The patient is 23 days old.
See Case 1, p. 100.

PLATE II.

Three views of the same foot placed in the same
state of view as when the preceding drawings
were taken, three months after the first drawing
was made, and the foot is now perfectly normal.
See Case 1, p. 100.

PLATE III.

Three views of an adult foot, showing the original
state of the disease before any attempts were
made to relieve it. The patient is 23 years old.
See Case 2, p. 100.

PLATE IV.

Three views of the same foot placed in the same
state of view as when the preceding drawings
were taken, three months after the first drawing
was made, and the foot is now perfectly normal.
See Case 2, p. 100.

OBSERVATIONS, &c.

OF all modern improvements, perhaps none have been carried so far as those made in the art of surgery, and the consequence of improvement in any capital art is improvement in all those which are dependant upon it, although the progress of these towards perfection may be retarded by various circumstances: thus it has happened to the art of making bandages, and other mechanical instruments which are so often necessary to assist the exertions of the surgeon; because, instead of being cultivated as a profession connected with surgery, it has been, too generally, abandoned to ignorant workmen of the meanest description.

GREAT improvements have, indeed, been made in some parts of this business, but they have been more frequently the effect of chance than of design; for the analogy of principle between those which have, and
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those which have not been improved, is so striking, that one would have imagined the introduction of a new and efficient principle in the treatment of one, would have led to the adoption of the same principle in the treatment of all; on the contrary, most of those diseases, which require mechanical assistance, are still treated in the same ineffectual manner; it is hence to be presumed, that any rational attempt at improvement in an art so necessary, and so imperfect, will be favorably received, as it will either be useful in itself, or stimulate others, who may be better qualified for the task, to accomplish so desirable a purpose.

ONE of the most important branches of this art, as well on account of the frequency of the diseases it is intended to remedy, as the imperfect manner in which they are now treated, and the consequences of that treatment as it may affect the future situation of the patient, is that of curing distortions in the legs of children: these, and their consequences, must be obvious to every observer, but it may be necessary to enquire into their nature and causes,

causes, as well as the principles on which they have usually been treated, in order to shew the importance of those improvements which will be explained in the course of this work.

ALL those distortions, to which the legs of children are liable, may be reduced to three classes, viz. such as are caused by the unnatural shape of one or more bones; such as are caused by the improper combination of two or more bones, and those in which the two former causes are combined in the same subject.

OF THE CLUB-FOOT.

IF we consider these diseases in the order they occur from the beginning of the patient's existence, the club-foot has the first claim to our attention: if all the varieties of that disease may be included in one view, it may be said to include all the circumstances of unnatural form and improper combination of bones; but, in order to form clear ideas of this disease, and the probability of treating it with success, it will be necessary to consider its varieties

in different patients, and its variations in the same patient, but at different periods.

THE club-foot may be occasioned by dislocation, or other accidents, at various periods in life ; but, as these are anomalous cases, it is necessary to limit our attention to that which frequently occurs in new born children, and is, alone, the subject of our present investigation. It is, apparently, occasioned by some disproportion between the uterus and its contents, or some peculiar position of the fœtus in utero ; and, in various cases, seems to take place at different periods before the birth, since in some, although the child has no power to hold the foot in its natural form and position, it may be immediately placed in them by the hand of the practitioner ; in others, the distortion is too great to admit of that practice, although the foot is still capable of some motion ; but, in others, it is perfectly rigid and incapable of moving at all,

If a foot, wholly clubbed at the birth, be compared with one in the natural state,
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it will be found to vary from it nearly in the following circumstances: the sole is turned upwards and inwards, so that the under part of the toes will be visible, the outer and upper part downwards; so that, if the child could stand, it would be upon the side, and some portion of the superior part of the foot instead of the sole. Vide Plate I.

It is to be lamented, that those who have written on distortions of the legs of children, have been more attentive to the position in which the limbs are placed, than the alteration in the natural state of the parts produced by those distortions. Hence we read of *varii* and *valgi*, in which the feet are turned outwards or inwards, without being able to form a clear idea of the cause of these deviations from the natural forms; by some they are said to be occasioned by luxations, dislocations, &c. by others they are attributed to the unnatural form of bones, ankylosis, &c. and the methods of treating them recommended are equally vague and destitute of any well founded principle: so much so, that if we
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except one method of treating the club-foot recommended by Mr. Cheselden, and which is only applicable to one particular state of the disease, it will be, perhaps, impossible to produce a single proof that this disease has been perfectly cured in any instance whatever.

MR. CHESelden mentions, with approbation, a method of curing the club-foot by placing it in its natural position, and binding it with strips of cloth, dipped in white of eggs, to confine it there, and repeating this operation until the defect is cured.

ANOTHER method of treating this disease has been by fixing leg-irons of various constructions upon the leg, and binding the foot upon them, with a view to reduce it into its natural state by compression from the bandage. A third method has been by placing the foot in boxes of tin, lead, or copper, of a convenient form, and binding them so that the compression of these boxes shall reduce it to its natural state. It has been proposed to effect the same purpose by binding the feet in strong boots of leather, &c.

&c. But what has been considered as a superlative exertion of ingenuity, was the invention of an old shoemaker, and is as follows, viz, the feet are bound as flat as possible upon two metal soles, and then inserted into two shoes, which are connected together by an iron fixed in each heel; this iron contains a joint with a ratchet wheel; when the feet are confined in the shoes, the toes are to be turned outwards by degrees; the ratchet wheel is to confine them in their newly-acquired situation, and by a repetition of this process the feet are to be turned, twisted, or wrenched into their natural situation and form.

It is obvious, that Mr. Cheselden's method can only be useful in that particular state of the disease in which the foot can be immediately placed in its natural position; some such cases I have known cured upon this principle, by keeping the feet bound up with strips of adhesive plaister, until they had acquired the proper habit; but where it is intended to produce an alteration in the form of the foot, this method has no power, and is, therefore, no farther worthy of attention.

THE other methods I have mentioned, are founded upon an idea that the disease is caused by malformation of the bones of the foot or leg, perhaps of both : but as it will hereafter be made evident, that this is not the fact, few arguments will be necessary to prove these methods are not well calculated to cure it ; it may, however, be advisable to shew that, if it was a disease of the bones, these methods are not calculated to remove it, and, of course, some more perfect mode of treatment is still a desideratum.

It has been asserted, by the friends of this system, that the bones of young children are so soft, that, by the compression of proper bandages, they may easily be reduced into their proper form : without denying the whole of this position, it will be easy to shew the fallacy of the latter part of it. Whatever bandage acts upon the bones, must previously act upon the soft parts under which they lie : it is obvious, that the delicate structure of a newborn infant cannot bear much compression without being injured ; and if the bandages

are so applied as not to injure the soft parts, they can produce no effect upon the bones: it is likewise to be remarked, that a simple bandage is tightest, consequently produces the greatest effect when it is first applied, but as it cannot be so applied as absolutely to prevent all motion of the parts, the attempts of the child to set itself at liberty, soon loosen the bandage; so long as they remain without being rebound no effect whatever is produced; his strength and impatience of restraint increases, the inconveniencies of this mode of proceeding are multiplied daily, and the advantages which were at first expected from it diminish in proportion, till in a short time it is laid aside, and the patient abandoned to be a cripple for life. The shoemaker's system is too absurd to be adopted by any one who has the least knowledge of the disease or structure of the parts, and those who have recommended the others, in all probability only do so because no better has been known, as they seem, by generally advising that nothing should be done in these cases till the child has acquired strength enough to bear the necessary treatment,

ment, to be perfectly aware of the objections to which they are liable. The many persons that are every where seen with these feet, furnish additional proofs of the inefficiency of all methods of treating them that have hitherto been practised, and justify me in repeating my assertion, that it will be difficult, if not impossible, to produce a single instance of a club-foot, compleatly diseased, being cured by any method hitherto known.

As the bandages which have been used in the intention of curing the club-foot, are similar in principle to those which are applied to all other distortions of the extremities, it may be advisable to consider the general principles upon which the whole are constructed, in order to shew their inefficiency, and the superiority of those elastic bandages which I have found by reiterated experience to be infinitely more effectual.

THE original idea of bandage for surgical purposes, must have been that of a broad ligature to go round the part affected, upon which it was either to act itself, or to

assist other substances that were intended to do so: where this was found ineffectual, a compress was added; if more strength was required, pieces of iron, &c. made as near as possible to the supposed or intended state of the parts were adapted, till by the multiplicity of such additions, bandages of this description became highly inconvenient as well as ineffectual. Such bandages were most commonly applied to ruptures; the elastic bandage was invented by mere chance, its superiority was evident, it was universally adopted, and patients who have now occasion for such assistance, derive from it a degree of safety and comfort to which their predecessors in misfortune were always strangers.

WHEN it was thought advisable to apply mechanical inventions for curing the distorted legs of children, the mechanism used in the treatment of fractures naturally suggested a principle upon which such instruments might be made; but though there is some analogy between the principles upon which fractures and distortions of the extremities should be treated, so far as mecha-

nical application is concerned, the difference between the two diseases is so great, that what may justly be considered as perfection in the treatment of the one, would be very inadequate if relied upon when applied to the other. In fractures, the intention is fully answered by keeping the limb steady in one position until a cure is effected, and the mechanical assistance necessary to effect this is perfectly in the surgeon's power ; but, in order to cure distortions in the limbs of children, the action of the instruments to be used should be permanently exerted, and capable of being constantly increased ; for, the moment the progress of that action is discontinued, all progress towards a cure is at an end.

As the joints are too frequently the parts most affected by those distortions, and as the time requisite to effect a cure is supposed to be very great, the machinery used should be so adapted as to admit of loco-motion : this is commonly done by making joints in the irons correspondent to those in the limbs, and leaving the bandage so loose as to admit of the necessary motion,

tion, which, it is evident, renders them almost useless, supposing they were in themselves an adequate remedy for the disease, which, upon a farther examination, it will appear is by no means the case.

THE principle upon which all these instruments are constructed, is to place a strait support on one side the distorted limb and, by means of bandages, bind it to that support till it becomes strait.

As there is an indispensable necessity for making joints in these instruments, and leaving the bandages so loose as to allow of necessary motion in the limb, and as simple bandage, to which principle this apparatus is reducible, can only act by compression, it is evident that in practice they cannot produce the effect of which, in theory, they may be thought capable of. In order to apply them, they are usually fixed to shoes, and therefore their connection with the limb they are intended to act upon, is not sufficiently intimate to keep it in its natural direction, and as removing them from one shoe to another is extremely troublesome, a
common

common practice is to make them as strong as possible, in order to make this removal less frequently necessary: hence it frequently happens, that in addition to all other imperfections of this mode of treatment, a child, naturally perhaps delicate, and rendered more infirm by imperfections in its limbs, is incumbered with an unnecessary weight of iron and shoe, and that weight so applied as to act upon mechanical principles in the most disadvantageous manner, as an impediment to his loco-motive power, and all this under the pretence of assisting his motion and curing his deformity.

It is an acknowledged principle in mechanics, that any weight placed upon a balance increases in power as it recedes from the center of motion; as the pelvis and parts connected with it are the basis from which all the muscles whose action are conducive to loco-motion act, and as the foot is farthest removed from that basis, it will follow, that, if the above principle was justly applied to the construction of these instruments, they ought, whenever it is possible,

possible, to be immediately connected with the pelvis instead of the foot, upon which they must act with treble force as far as their weight can operate in impeding the child's loco-motive power; and, when it is stated that one of these instruments, with its shoe, &c. will frequently weigh half, and sometimes three quarters of, and even in some instances a whole pound, it will be easily granted that this is, in every sense, a very forcible objection to the use of them.

As so much has been said of the defective principles upon which these instruments are constructed, it would seem invidious to enlarge upon the various ways in which they are frequently misapplied: but it will be permitted me to observe, as the effect of near twenty years observation and experience that, although these instruments are constructed upon principles not totally inapplicable to the diseases they are intended to cure, they are so inadequate to the purpose, that not one patient in twenty, upon whom they are applied in the common

mon way, derives any benefit from the use of them.

HAVING so many opportunities to confirm the truth of this observation, I was naturally stimulated to attempt to substitute some more effectual principle in its stead : after many disappointments, and reiterated experiments, I have succeeded in reducing to practice, a system of treating these diseases, by which they may be speedily cured, without being liable to those objections which have justly been made to the old and imperfect method of treating them.

THE idea upon which this method is founded is to substitute a spring, so adapted to the nature of the distortion, that, when bound upon the limb, its action will draw the deformed parts into their natural situation ; when it is necessary to allow of motion in the limb, that motion, by increasing the re-action of the spring, accelerates the cure : this effect is directly contrary to what has been experienced from the common

mon instruments that have been used for the same purpose.

SUCH is the general idea upon which this system is founded; its application will be explained in treating of the particular distortions to which I have applied it with success.

To return to the club-foot: in saying that very erroneous opinions have been formed respecting the nature of this disease, it is not meant to insinuate that every opinion that has been formed upon particular cases has been erroneous, although it is certain that, as it is not the subject of any known regular treatment, few persons have opportunities of seeing many patients who have it, or the same patient at different periods of his life: hence, many have formed general ideas of the disease, from the particular cases which may have come under their observation; their opinions have for this reason been contradictory, and many of them erroneous, which renders any attempt to ascertain the true nature of the disease an object of considerable

able importance towards establishing a rational method of treating it, with the greatest success it is susceptible of. If, upon inspecting a foot of this kind in an adult patient, we should conclude it originated from malformation of the bones, because the bones of this patient's foot are not naturally shaped, we should form a false opinion of the disease, generally considered, notwithstanding our opinion of the case in question would be right; and, in consequence we should probably abandon every other patient with such feet to his fate, falsely supposing them to be incurable: if, on the contrary, we should make it appear that at some periods of every patients life it is a curable disease, and thence infer every patient who has such feet may be cured we should promise much more than is, in the nature of things, possible: but if we make it evident that at one period of every patients life it may be easily and perfectly cured, at another cured with some difficulty, at another is susceptible of much alleviation and at last not to be alleviated in the least, we shall give a comprehensive idea of the disease, and form a just opinion

of the benefit every patient may expect to receive from the proposed treatment.

As opportunities of examining this disease by dissection during its earliest period occur but seldom, we are reduced to the necessity of forming our opinion of the state of the diseased parts upon what we know of their nature in healthy subjects; this may be thought to reduce our opinions concerning the nature of the disease, to the condition of a mere hypothesis: but, if upon this hypothesis we found a mode of treatment that is successful in removing the disease, and its efficacy can be accounted for upon no other principles, it will establish the truth of the opinion upon which it is founded as fully as can be desired, or as the nature of things will admit.

UPON a slight inspection of this disease, one might perhaps be excused for saying, so much deformity could only be occasioned by malformation of some bones in the foot; but when the natural progress of ossification is considered it will be difficult

to find an excuse for saying those bones are unnaturally shaped, when they are so near the cartilaginous state, that they can hardly be said to have become bones at all: in fact there is great reason to believe that at this period the bones are not the seat of the disease, of course all attempts to relieve it by operating upon them will always prove futile and ineffectual,

If this is not a disease of the bones it may be asked in what does it consist? a little attention to the cause of it may enable us to form a true opinion on the subject: from circumstances already mentioned it is evidently occasioned by some compression prior to the birth, and if the position of the fœtus in utero be considered, it will be evident that this compression will deprive the exterior muscles of the foot of all power of moving, and in consequence of much of their power of contracting themselves; on which much of their capacity for motion depends; the contractile power of the flexor muscles is proportionably increased; and, in consequence the
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foot is incapable of resuming its natural situation after the compression is removed.

VOLUNTARY muscular motion, at least so much of it as relates to loco motion, seems to depend upon this principle; every set of muscles which act upon any part in a peculiar manner are equal in power to their antagonists, and every action is performed by connecting volition with the muscles proper to produce it; the first action is counteracted by transferring volition to the antagonists in their turn, and, so long as it can be thus equally transferred from one to the other, the natural form of the parts will be preserved, and their actions properly performed: but if by any accident, the peculiar action of any muscle is impeded, the corresponding action of its antagonist is increased, and this inequality of action will continue to increase till the impediment is removed: upon due consideration it will, therefore appear that this effect is produced by the compression of the foetus in utero, and the child is born with his feet distorted by contraction of all the flexor muscles of the foot.

A CHILD,

A CHILD, from the time of its birth, has inclination to move, though it possesses but very imperfectly the power of directing its motions; this is acquired by efforts continually repeated until it begins to walk: if the parts are naturally formed, and no accident intervenes to impede their motion, it then acquires the power of using its feet in the natural way; but if there is any impediment to their natural motion, it acquires the habit of moving as near to the natural as that impediment will admit: hence, it is evident, that the cure will be more difficult in proportion as the attempt is deferred after the birth, because, in a patient of five or six months old, it will be necessary to counteract the diseased habitual action of the parts, as well as the original impediment.

If a child that has feet of this kind is suffered to walk before a cure is attempted, it is evident, that he must place his feet in a position that will not bear him, without undergoing farther alteration by sustaining his weight: this must produce additional deformity, by still farther deviating from the natural relative position of the bones:
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though this circumstance may not render a cure impossible in all cases, it certainly will make it more complex, tedious, and uncertain, as in every one it may not be easy to determine whether the position in which they are placed by it may not be such as will render a cure absolutely impracticable.

If no attempt is made towards a cure before the bones of the foot are compleatly ossified, it is certain that they will acquire some deformity, and so much of the disease as depends on deformity of the bones is, from that moment, irremediable: but circumstances certainly do exist in many cases at this period, which may be alleviated so far as to render the feet more useful than they would be if entirely neglected. If the disease is neglected until the bones are compleatly ossified, and the patient so far advanced in life as to have acquired fixed habits of using his feet, all attempts towards a cure must be considered as extremely absurd, although he must still have recourse to assistance from art, in order to enable him to move with any facility.

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If this theory of the disease should be just, it will appear that the cure must be effected by extending the contracted muscles, by encreasing the power of those which have been diminished, and thus restoring that equilibrium which always exists between the flexor and extensor muscles in the natural state: this cannot be done by bending, twisting, or binding the feet in any particular position, which is all that has been attempted by the various methods that have as yet been recommended with a view to effect a cure; it can only be effected by applying, externally, an elastic power so adapted to the existing state of the parts, as to render the extensor muscles of the foot, with such assistance, something more powerful than the flexors, without producing absolute permanent extension: by proceeding in this manner, the feet will be stimulated to action, that action will increase the effect of the elastic bandage applied, and accelerate the restoration of the parts to their natural state.

If my idea of the disease is just, and the proposed method of treating it practicable,
I shall

I shall be authorised to draw the following conclusions à priori, viz.

1st. THAT species of club-foot with which children are frequently born, may be perfectly cured, provided the cure is undertaken before the child begins to walk, though the difficulties to be overcome will always be increased in proportion as the attempt is deferred after the birth.

2d. It is not impossible that many cases may be perfectly cured, if undertaken after the patient has walked, though this must depend upon circumstances, in particular cases, which cannot be foreseen, and therefore is not advanced as a general fact. It is certain, however, that in every case of this description, the deformity may be greatly diminished, and the feet rendered more useful than if totally abandoned to their fate.

3d. If the cure is not attempted till the bones are completely ossified, it cannot be effected, and, in many cases, the deformity cannot even be alleviated, though

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the exertions of art may be necessary to prevent it from being increased.

How far facts will justify the preceding conclusions, may be collected from the following cases.

C A S E I.

DECEMBER 17th, 1793, I was desired to see a child born with two club-feet; he was then 23 days old. The gentleman who attended as accoucheur thought nothing could be done to assist, and therefore had abandoned him to his fate. Dr. Turnbull was consulted; he entertained a different opinion, and therefore recommended that I should be sent for.

UPON examination, it appeared, that the gastrocnemii muscles and tendo achilles of each leg were contracted as much as possible, and the foot drawn into the position it must always be placed in by that contraction of those parts: the tibialii were likewise contracted, of course the inside of the foot was hollow, and the outer convex;

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all the flexor muscles of the foot were contracted, by which means the whole foot was turned downwards; in its general appearance, the foot was shorter and thicker than it naturally should be, and placed in such a direction, that if the child had been capable of standing, the exterior and superior parts of the metatarsal bones would have touched the ground; the disproportion between the fore-part of the foot and the heel was so great, that I was inclined to believe, contrary to the general idea I had formed of the disease, that the os calcis was smaller in proportion than it should be; one of the feet was perfectly rigid, the other capable of being moved a little by bending it with the hand, and it had been observed, that both had grown worse since the child was born.

WHOEVER is acquainted with the structure of the foot, and action of its parts, will allow, that any attempt to cure this deformity, by bending the feet in any particular direction, must have proved injurious instead of beneficial; and if my sys-

tem of treating it was practicable, it could only be effected by applying an elastic power, and varying its action so as to produce extension of the different contracted muscles alternately, thus proceeding by degrees till the feet were brought into their natural state.

I HAD had many cases in patients farther advanced in life, and though circumstances had rendered it impossible for them to be perfectly cured, I had done so much more for them than had been thought possible, that I had persuaded myself the disease might be perfectly cured, if taken in hand at the earliest period of life, but as a contrary opinion has very generally prevailed, I had had no opportunity to determine the fact: hence, I thought it not impossible that my expectations were too sanguine, I therefore determined to proceed in such a way, that whatever might be done short of a perfect cure, the child might be left in the best situation the nature of things would admit. Upon this principle, my first attempt was to produce extension of the gastrocnemii muscles and tendo achilles
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in each leg, since it is certain that if any part of the foot could be brought upon the ground, forming at the same time a proper angle with the leg, and the action of those parts preserved, the patient would at least be able to walk with facility, whatever deformity might remain in the foot: on the contrary I had seen cases in which the form of the foot had been altered, and great hopes of success formed in consequence, but the patient ultimately left in a helpless situation because this circumstance had not been attended to, or no means could be used to effect it.

WITH this view I applied proper elastic bandages, unbinding them every other day and binding them again, so as to encrease the power in proportion to the progress I had made: by proceeding steadily in this manner for one month I succeeded completely in that point; if the patient had been of age to use his legs at this time, he would have stood upon the outer edge of the foot and been perfectly capable of using his legs in that situation.

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THE apparent deformity of the foot still remained the same, I therefore, now applied bandages upon the same principle to produce extension of the tibialii muscles, and correct so much of the deformity as was occasioned by the contraction of them; after some time I endeavoured to produce the same effect upon the flexor muscles of the feet, directing my efforts alternately to them, and the tibialii: by unremitting perseverance in this plan I so far succeeded that on March 17th, three months after I first saw the child, I removed every part of the apparatus I had used to effect the cure as the feet were now perfectly well formed and not the least deformity remained.

PLATE I. contains three views, of one of the feet drawn December 17th, 1793; before I applied any bandage: Place II. contains three views drawn from the same foot, March 17th, 1794. Upon comparing them an accurate estimate may be formed of the effect that had been produced.

REMARKS.

R. E. M. A. R. K. S.

It will be evident, upon comparing these plates, that as the whole alteration in the feet, had been produced by extension of the contracted muscles in a very short space of time, those muscles which pass over the superior part of the foot could not have recovered their proper tone and action; all the soft parts on the top of the foot were in wrinkles, in consequence of the alteration they had undergone: it was, therefore, to be feared if the feet were set at liberty at this time they would in some degree relapse into their former deformity, from the imperfect action they were at present capable of. To prevent this I continued to keep the feet bound in their natural position by very light bandages till I thought no farther attention, in this respect necessary.

In considering the effect of mechanical applications upon the human frame, we naturally connect the ideas of pain, suffered by the patient, in proportion to the force exerted by the bandage; and, by applying this principle to the cure in question, it will be inferred, that as great effect was produced,

considerable pain must have been suffered by the patient. To prevent the conclusions that may be drawn from this inference, it is necessary to observe, that this child never suffered pain from the application of the bandages; I applied, and changed them continually while he was at the breast, asleep, and in every other situation, and in none did he ever give the least signs of uneasiness.

MR. CHESELDEN, in speaking of the disease, says, that tight bandage wastes the leg and makes the foot swell, and it has been observed that this effect has always been produced by all the methods that have been attempted to cure this disease: the present instance is, however, an exception, for though it was feared that such a circumstance might take place, the event has proved that fear was groundless, for he is at present a fine healthy child, his legs and feet in every respect well formed, and in full proportion to the rest of his body.

I AM desired by the parents of this child not to insert their address in this work,
but

but am authoris'd to say, that any gentleman who may be desirous of ascertaining the truth of what I have written will be referred to them who will give every satisfactory information that can be required : but as there may be some persons too sceptical to believe either my statement of the case or the account that may be given by the parents, it may be necessary to add, that as I was aware of the importance of authenticating this case beyond the possibility of contradiction, I took every necessary precaution for that purpose. Dr. Turnbull saw it before I was employed ; I requested a medical friend to see it with me before any thing was done ; he saw it again during my attendance, and at the time I discontinued it : about this period I likewise requested a gentleman, whose judgment is unquestionable, to examine the feet, and the opinions of these gentlemen are here subjoined, which it is presumed will be deemed sufficient testimony to the reality of the cure.

TO MR. SHELDRAKE, No. 50, Strand.

SIR,

MR. ———'s child was born with two completely formed club-feet ; I recommended him to you, believing you would do whatever might be possible to assist him, though I could not determine how far that assistance might relieve, and did not imagine it would go to the extent of perfectly curing him.

I HAVE seen him since you declined attending him, and have the satisfaction to say, there are no remains of the original disease ; the feet are now perfectly well formed, and, as far as can be determined respecting a child of his age, are in every respect as perfect as if they had never been deformed.

I CONSIDER your system of treating these deformities as a material improvement in an art, till now, very imperfect ; I hope the event of this case will be the means of making it generally known, and by this
means

means prevent many persons from becoming cripples for life, which has generally been the fate of such as have been born in this situation.

I am, Sir,

Yours, &c.

Wellclose Square,
April 22d, 1794.

WM. TURNBULL, M. D.

Physician to the Eastern Dispensary.

HAVING seen a bad case of distorted feet, under the care of Mr. Sheldrake, in its different stages, from the commencement of his plan, till the cure was nearly completed, it is but justice to his merit to certify, that I believe his method of treating such distortions to be the best hitherto discovered.

THE means which he employs, appear to me likely to prove successful in general, if had recourse to in time, and to prevent such frequent examples of deformity, as we now see, from occurring in
F 2 future.

future. In the present instance, the progress made in the cure was so quick as to exceed my most sanguine expectations.

Witness my Hand,

JOHN RING,

New Street, Hanover Square,
April 25th, 1794.

TO MR. SHELDRAKE, No. 50, Strand.

SIR,

I HAVE this day examined your patient, the son of Mr. ———, whose feet, I am happy in saying, are perfectly free from distortion, and, to all appearance, likely to continue so.

I HAVE little doubt, from the advantages the patient has derived in the present case, that those who labour under similar infirmities will experience the same benefits.

I HAVE only to add, that I wish you all the success the ingenuity of your invention merits.

I am, Sir,

Your most obedient Servant,

WM. LYNN.

Parliament Street,
April 5th, 1794.

C A S E II.

JANUARY 1st, 1794, Mrs. Frazer, No. 2, Mercer's Court, Tower-Street, brought me her son, born with one club-foot: soon after the birth she had employed some work people who made some kind of boots, which were constantly worn, though without any benefit, until the child was four months old: she then consulted Mr. Lynn, who sent her to me,

THIS foot was treated in the same manner as the preceding, and with equal success, for in three months it was reduced to its natural shape, and capable of being placed in its natural position: in one circumstance, however, it differed materially from the preceding, for, on removing the bandages from the first, the feet remained in their natural position, even when the child made every possible effort to use his legs, but when they were removed in the second case, the foot immediately inclined towards its former position, and, in all probability, would again become distorted if left to itself.

R E M A R K S.

THIS difference in the effect produced by the same treatment, in two instances of the same disease, is accounted for by the cure being deferred so long in the latter case. In the former the child had acquired no habit of using its legs, they, therefore, immediately took the direction impressed upon them by the bandages, without making any other resistance than was occasioned by the contraction of the parts : but a strong healthy child, of four months old, has acquired the habit of using his legs with a considerable degree of power ; and that habit deviates from the natural, in the same proportion as the shape of the diseased feet varies from the natural shape : on this account the diseased habit, or mode of action, must be totally destroyed, as well as the feet restored to their natural shape, before the cure can be complete ; and, as this habit had been so long confirmed, it must require a much longer time to destroy it than was necessary merely to restore their feet to their
natural

natural shape : hence I infer the necessity of beginning to cure these feet as soon after the birth as possible.

C A S E III.

FIVE years ago, a gentleman at Croydon sent me a child who was born with two club-feet : she was healthy, about eighteen months old, and much inclined to use her feet, though nothing had been done to assist her ; when she was allowed to stand, it was upon the outside of her feet, the edge of the toe nails pointing directly to the zenith : as the parents lived at so great a distance that I could not attend them, and for the same reason the child could not be brought to me in the manner that would have been absolutely necessary for me to do the child justice, I was obliged to give the mother proper bandages, with such directions for the use of them as I could explain to her, and desired to see it occasionally. I have reason to believe the mother paid every attention she could to my instructions, for in about eight months

months the child was able to walk flat on her feet, and with as much activity as any child of her age, though there was much deformity remaining in the feet; and, when the bandages were removed, some tendency to return towards their former situation.

THIS case I cannot think a fair specimen of what may be effected by my method of treatment, as it was never immediately under my management: but it sufficiently proves that much may be done even at those periods, when this disease has been universally abandoned as incapable even of alleviation; I am even convinced, from what I have since seen in many other cases, it might have been perfectly cured if it had been properly attended to; for, if an ignorant woman, without any experience, could do so much, what might not have been expected had it been possible for me to attend to it in a proper manner? The event of this, and of several other cases I have seen, convinces me so fully that no person who is not well acquainted with the structure of the foot can take proper care of them, that I should
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be destitute of due regard to a patient's welfare as well as my own reputation, if I could ever be again prevailed on to do any thing for a child in this situation without having the case entirely under my own management.

I HAVE said that no method of treating this disease has been found completely successful, except that which has been proposed in these observations; I am sensible there are many ready to assert the contrary; but this I pay no regard to, from a conviction that it is untrue; in proof of which, I hope I shall be excused for inserting the following history of a case which I can authenticate in the most satisfactory manner.

C A S E IV.

A PERSON of high rank had a son born with two club-feet: by the advice of the late Mr. Middleton, a person was immediately employed, who undertook to cure them: this man was the inventor of the screw shoes I have already mentioned; and,

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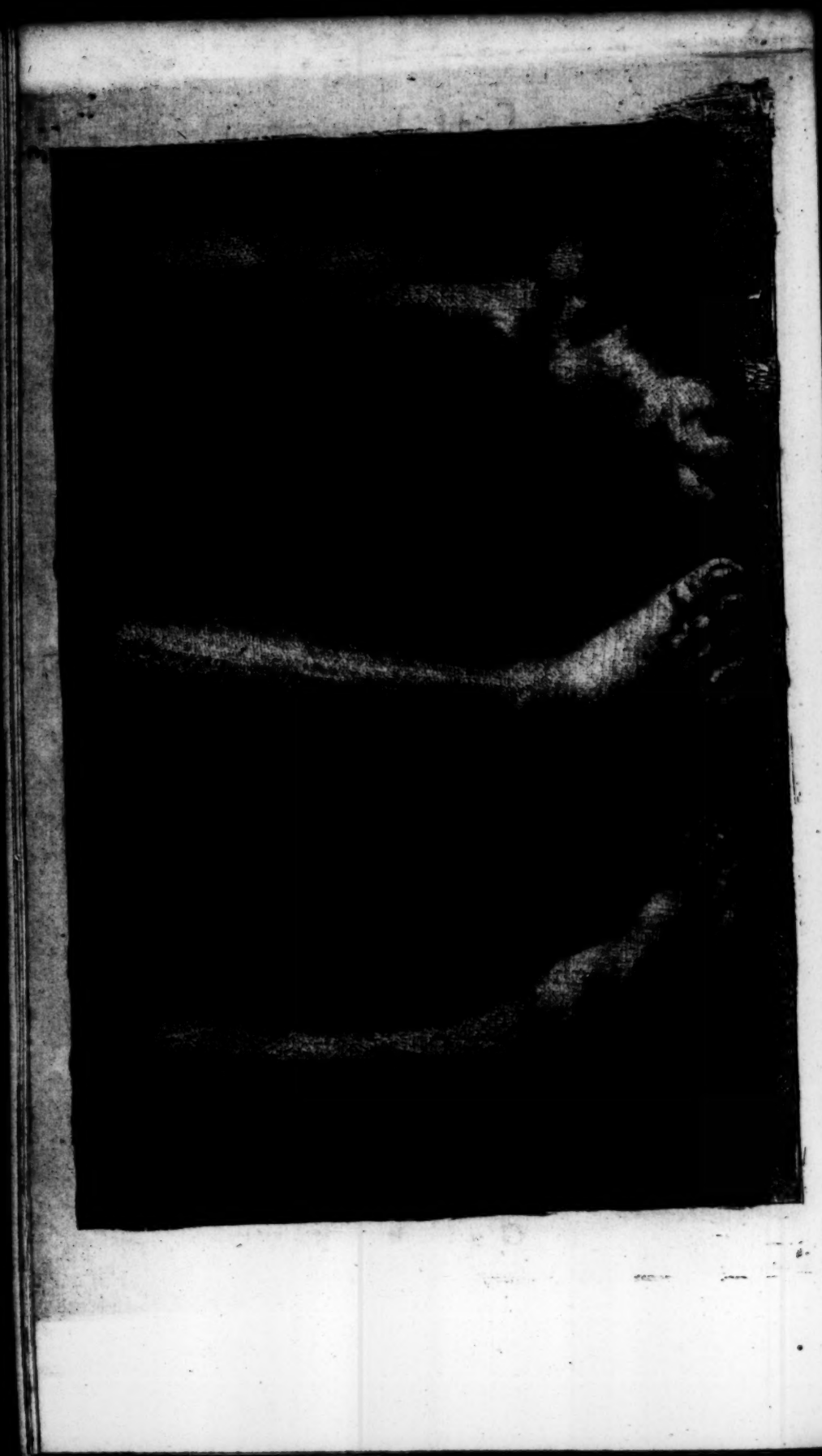
after attending as long as he thought proper, declared the patient cured; *i. e.* he had done every thing in his power towards the cure; it was, however, admitted, that the feet were not perfect, it was supposed that this was owing to an insurmountable defect in the original formation; and it was afterwards found, that notwithstanding the pretended cure, the feet were nearly in the same state as at the time of the birth.

A RELATION of my own was then employed by Mr. Middleton, to make him leg-irons, upon the common principle, with which he went on for several years, as most patients do in similar situations, *i. e.* without any amendment. At this time an old shoemaker in the country was talked of as eminently successful in matters of this sort; the child was put under his care, and, in due time, *discharged by him as perfectly cured!* In a short time it was still found necessary to return to the use of leg-irons, which he constantly wore till he arrived at years of maturity, when he was recom-

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recommended, by a surgeon of the first eminence, to me.

THAT I might be enabled to give him all possible assistance, I had his feet cast in plaister of Paris: these casts are now in my possession, and Plate 3 contains three views of one of these models, from which a good idea of his situation may be formed: the gastrocnemii muscle, and tendo achilles in each leg, are so totally contracted, that his heel cannot be brought within four inches of the ground, nor is he capable of moving any part of his feet in a natural direction; he is even incapable of standing erect without using very heavy irons, and half-boots, constructed with false heels to fill up all the space between his heels and the ground; and, by these means, he is enabled, in some degree, to bear the weight of his body, though, with the utmost exertion, he cannot walk above a mile or two without being extremely fatigued.

R E M A R K S.

If this case is compared with many we continually see that have been totally neglected, this patient's situation is much the least enviable ; they are capable of walking with facility, notwithstanding their deformity is greater than his ; but he, in consequence of the constant, though fruitless attempts to relieve him, during the greater part of his life, has not acquired the diseased action peculiar to such feet, nor any mode of action that approaches at all to the natural, and, in fact, he is scarcely capable of moving at all.

If, while we contemplate this specimen of the imperfect state of the art, we compare it with Case I. it will afford a most convincing proof of the superior efficacy of my method of treating the disease: in the former case, every exertion, that rank and fortune could procure, was made, with what success it is unnecessary to repeat ; in the other, the success has been so rapid, that, at the end of four months, no vestiges of
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the disease remains. I am sensible that this mode of treatment is still short of the perfection it is capable of; but, from the event of the cases I have related, think it fair to conclude, that this species of deformity is as perfectly curable as any disease which the human frame is liable to.

ONE reflection more arises from the circumstances of this case; it is on the extreme baseness of those wretched empirics, who boast of having performed cures which it was never in their power to complete. No man is censurable for not doing more than the existing state of his art can effect; upon this principle, the various persons in whose hands this gentleman has been, would have incurred no blame because they did not effect his cure: but notwithstanding the convincing testimony I have produced to shew what his case is, and, of course, what it was when they left him, they continually boast that they have perfectly cured him, and (as his rank precludes all personal application to ascertain the fact) his name has been used for many years to impose upon others, by giving the appearance

pearance of authenticity to their false pretences. That an ignorant shoemaker, who attempted to rescue himself from beggary, by the practice of quackery, should do this, is by no means surprizing ; but that one, having a legal claim to rank as a professional man, should pretend to have learnt the secret of performing such cures from this shoemaker, and mention this gentleman's case as a proof of his preceptor's wonderful success, is, indeed, an astonishing, and (I hope, for the credit of the medical profession) a singular instance of moral turpitude.

ON INCURVATION OF THE BONES OF THE LEG.

OF those distortions which take place after the birth, the earliest in its appearance, the most disagreeable in its consequence, and the most difficult to cure, is curvature in the bones of the leg: it never appears until the child begins to walk, often about that period, and, not unfrequently, at different periods after that time, it is said, in general terms, to be occasioned by placing the child on his legs too soon; this

this may sometimes produce such an effect, but, by no means so frequently as to be considered a general cause of the disease. As this false idea of the cause has given rise to very improper methods of treating patients, so circumstanced; it may not be useless to make some enquiry into the nature of the disease, as that may lead to a more perfect method of cure, or, at least to the prevention of the increase of some of its most disagreeable effects.

WITHOUT enquiring minutely into the nature of those substances of which the bones are formed, it will be sufficient to observe, that they consist of two distinct parts: an organised animal matter, from which they derive their form, and an earthy substance, deposited therein, to give that degree of strength which is necessary to enable them to perform their functions: in their progress from the birth to maturity the central part of each bone is first formed, here its earthy part is first deposited, and proceeds gradually towards the extremities, until the whole is completed: hence it is, that the bones of the arms
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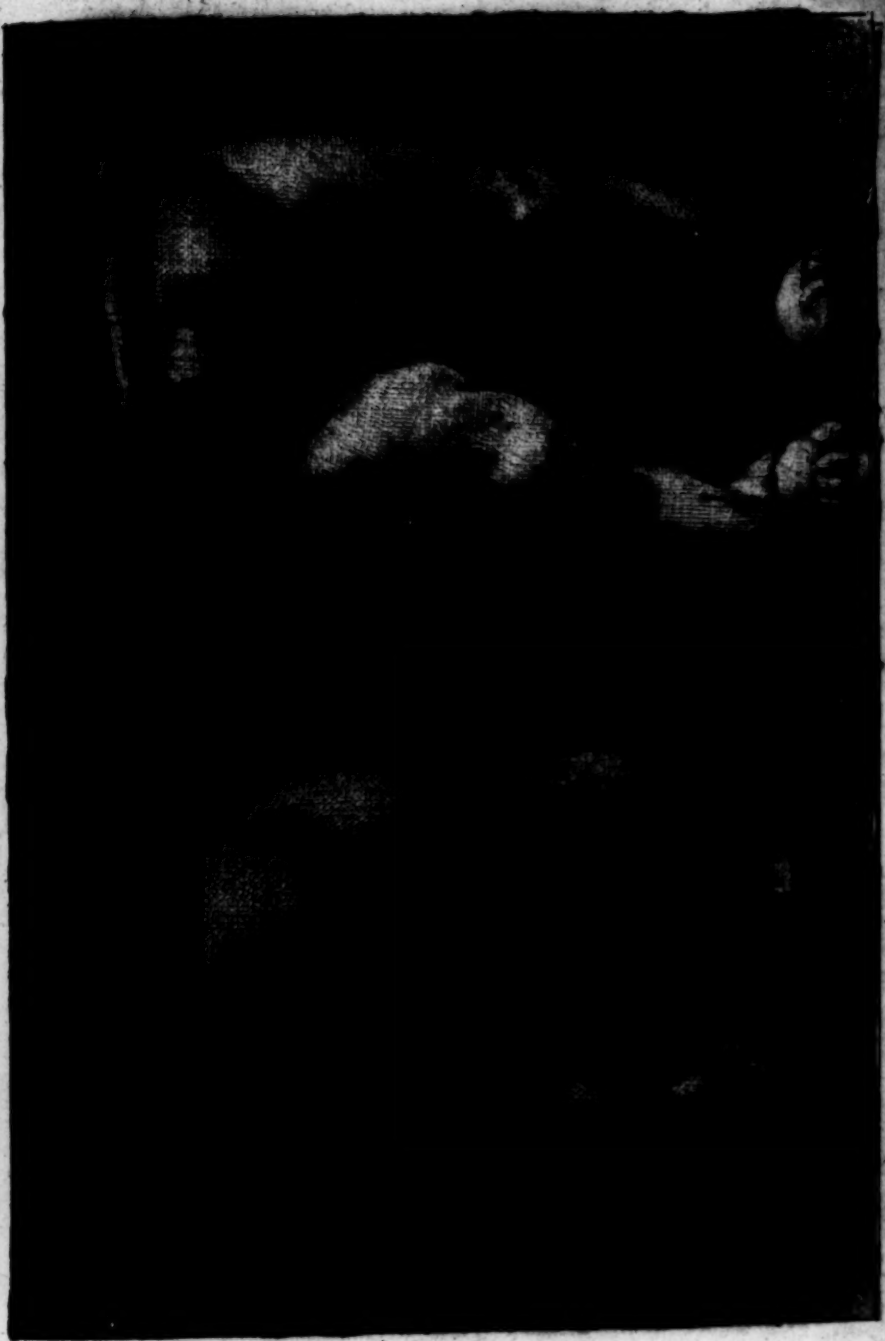
and legs are always most compact towards their central part, becoming more spongy and soft towards the extremities, and, of course, are there most liable to be acted upon with most effect by any cause that may diminish their strength or alter their form.

IN order to eradicate the ricketty disposition from the constitution, it may be necessary to ascertain how far it is connected with scrophula, or, is a distinct disease ; or, whether the softness of bone in ricketty children is caused by abstraction or alteration of their earthly, or debility in their organised part: but as the intention of the present observations is only to obviate, to alleviate, or to cure some of its mechanical effects, they will be confined solely to those alterations produced by this disease, which are in their nature likely to be counteracted by mechanical applications only. In conformity with these principles, it will be sufficient to observe, that the disease in question always appears in ricketty children ; if that disposition comes into action before the child begins to walk, its first effect,

effect, which is enlargement of the extremities of the bones, frequently escapes observation ; but when he begins to walk, his legs bend under his weight, in consequence of deficiency of strength in the bones ; that effect must continually increase, unless assistance is provided to supply that deficiency until the producing cause is removed from the constitution : the curvature of the legs undoubtedly is produced immediately by the weight of the body acting upon them while they are unable to support it ; but the cause of this is not placing the child upon his legs too soon, for the same effect would have taken place at whatever period he began to walk ; it is the effect of a peculiar disposition existing in the constitution, which must be eradicated before that effect can be removed ; and as one of the means of doing this must be by constant exercise, it is necessary that he should be stimulated to action by every means, providing such assistance as shall at the same time prevent the curvature from encreasing, and diminish it as much as the nature of the case will admit.

By this disease the bones of the leg are sometimes bent directly forwards, the front of the tibia projecting over the foot; at others outwards, forming an arch, with the most projecting part over the outer angle; at others the reverse of this, and sometimes the curve consists of a mixture of two of these simple ones. A good idea of this disease may be formed from the annexed Plate, which was drawn from a subject in my possession. It is not, indeed, the worst distortion of the kind that I have seen, but it is fortunate for mankind that there are not many so bad. As this disease consists in positive curvature of some of the strongest bones in the body, it is in its nature more difficult to cure than any other distortion: by the common methods of treating it, so little good has been done, that it has very generally been questioned, whether it is not better to let it entirely alone, than to apply instruments which, certainly, do very little towards a cure: the affirmative of this question is, however, by no means to be allowed: for though I have known such instruments constantly applied during three years, without amend-

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ment, yet it is certain, that the patient would have got worse during that time if they had not been used, and the prevention of approaching evil is certainly a benefit, even if we cannot remove that which exists.

SOME have even gone farther than to dissuade the use of artificial means to cure this disease, by asserting that these distorted legs, get strait again merely by the efforts of nature, and talk of cases in which this has actually taken place: but, whoever considers the nature of the disease, and situation of the parts, will readily allow these pretended cures never take place, and, notwithstanding the positive manner in which their reality has been asserted, it will be easy to shew they have been led by inaccurate observation to mistake fallacious appearances for a real cure.

If we suppose a leg bent like the figure, Plate 4, to such an extent, that a line drawn perpendicular from the inside of the knee to the ankle, is one inch distant from the most inflecting part of the tibia; if,

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from the application of instruments, it is prevented from growing worse, or if from any alteration in the constitution, the tendency to curve is effectually checked, and the patient arrives at maturity, the leg will be nearly twice as long as it was when the curvature took place : by thus doubling the length of the curve, its apparent diameter will be diminished one half, notwithstanding its actual deviation from the perpendicular line has not been altered in the least ; and as this effect only takes place in those cases where the tendency to distortion was checked very early, and the curvature but trifling, it is not difficult to conceive, that an inattentive or prejudiced observer may easily mistake such apparent diminution for actual extermination of the disease.

WHOEVER considers the structure and form of the bones, the alteration that is produced in their substance by disease, and the manner in which they are affected by gravitation of the super-incumbent parts acting mechanically upon them, will easily conceive why no degree of deformity that
once

once exists in the bones of the leg can be removed without mechanical assistance.

It has been made a question; whether softness of the bones in ricketty children is caused by abstraction or alteration of their earthy, or debility in their organized part: leaving the discussion of this question to those in whose immediate province it is, it will be sufficient to observe, on the present occasion, that the effect of rickets always appear first in the softest part of the bones: as the legs, besides what they undergo in common with the other bones, suffer from the pressure of the body, whose weight they carry, they, particularly at the lower part of them, are always more bent than any other.

It must be evident, that so long as the disease which occasioned the deformity in question exists in the constitution, its effects cannot be remedied, although a leg distorted, from this cause, may be prevented from growing worse, at whatever period the proper means may be applied: it is even certain, that removing the original disease will

will not remedy the curvature it has occasioned in the legs; for, whatever may have been the pre-disposing cause, its ultimate effects have been produced by means merely mechanical; the pressure, from weight of the body, has caused the legs, previously weakened by disease, to bend, and the same pressure will effectually prevent them from becoming strait, unless mechanical means are used to second the efforts of nature. There is even reason to believe, that when the legs have been bent beyond a certain point, the weight of the body alone will continue to increase the curve, even after the ricketty disposition has totally ceased.

If a general opinion may be given upon cases of this description, it may, perhaps be said, with propriety, that all may be prevented from growing worse from the time they are assisted by proper mechanical applications; that many may be much alleviated, and not a few perfectly cured by the same means. In giving this opinion, however, it must not be understood that this is to be easily effected, or even to be done at all

all by the methods commonly pursued. I have known cases, treated with as much attention as the nature of those methods will admit, no better, at the expiration of three years, than when they were at first taken in hand. Even with the best methods that can be adopted, the progress of a cure must necessarily be most tedious, and the event uncertain; so much, that I need not hesitate to say it is of all distortions in the legs of children, that which is least likely to terminate in a manner satisfactory to the patient, his friends, or those who may endeavour to effect the cure. I have, indeed, completely succeeded in some cases I have treated upon the principles laid down in this work, and in much less time than similar cures would have been cured by any other method; but, even upon this plan, the process is so tedious, the attention requisite so great, and so much uncertainty in the event, that I feel myself perfectly justified in saying it is, of all the deformities of children, that in which the least hopes of a perfect cure can reasonably be entertained.

OF

OF INFLECTION OF THE KNEES AND ITS CONSEQUENCES.

THIS disease, as it may be produced by every cause that will occasion debility, is, perhaps, more common than any other distortion to which the legs of children are liable; fortunately for the sufferers, however, it is more certainly curable than any of them, provided due attention is exerted in making use of the proper means.

IN its worst stages it frequently happens, that the bones of the leg or thigh are distorted, sometimes, perhaps, from the circumstances of the disease, but much oftener, however, from the injudicious use of leg-irons badly made; but, in its early stages, it is only a disease in the ligaments of the joints occasioned by debility.

THIS is the general cause of the disease; its immediate cause in the many children that are afflicted with it are too numerous to be fully particularised; every species of general debility, by diminishing the power
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of the legs to support the weight of the body, and maintain their own natural position, will produce it; every accident that gives the limbs a decided tendency to any particular position will occasion it; but, as an attempt to particularise all these accidents, and other circumstances would be, in fact, to give the history of every instance of the disease; it will be sufficient, here, to mention the general fact, leaving it to particular observation to apply it in particular cases.

THE common idea is, that the knees only are bent; but whoever has a just idea of the form and connection of the bones between the pelvis and sole of the foot, must be sensible that the knees cannot be bent so far from their natural situation without occasioning a proportionable distortion in every other joint from the pelvis downwards. Upon viewing the manner in which the femur is connected with the pelvis, and the direction it takes from thence to its juncture with the tibia, as well as the natural position of the leg, it will be easy to conceive why, when the knee-

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joint

joint is affected by weakness, from whatever cause, it should bend inwards, and the feet, in consequence, be removed farther from each other than when in their natural state; this sometimes happens to such an extent, particularly when long neglected, that in some cases the feet have been found twelve inches a-part, when the knees have been close together.

IN some cases they have been known to bend outwards; but this is a different disease, compounded of this and incurvation of the bones of the leg; when *they* begin to bend outwards, the natural connection of the parts demonstrate why the knees must take the same direction; an example of this disease may be seen in Plate 4. A much more troublesome species of this disease is where the bones of the leg bend outwards and the knees in: though this disease may sometimes take place from a combination of the causes already assigned, it is more frequently produced by the injudicious use of leg-irons; this I am authorised to advance, decidedly, as I have seen many cases which

which prove the fact in the most positive manner.

To return to what may, in contra-distinction to these diseases, be called the simple inflection of the knees; it is commonly thought that the knees only are affected; it is allowed, indeed, that the ancles of the same patient are sometimes affected in a similar manner, but a separate cause is generally assigned for this; it is, however, certain, that the motions of the hip, knee, and ancle joints are so dependant upon each other, that no one of them can be distorted without producing distortion in the rest: it is equally certain, that all will be proportionably affected in which ever the distortion first appeared. This observation may be carried still farther; for, as constitutional debility is frequently a remote cause of these distortions, it most commonly appears that both legs are affected, though not equally: hence it has often happened, that when one leg has been properly supported, the other has manifestly become worse; from which it is to be inferred, that although distortion of

one leg does not, of necessity, follow the other, it so frequently happens, that it is always adviseable to pay some attention to both, in order to check this effect as soon as it begins to take place. Excepting the debility or other accident that occasioned the weakness in the joint, all the effects of this disease are to be accounted for upon mechanical principles only, and can only be remedied by mechanical means: the original disposing cause to be always treated as a separate disease.

THE intention of cure in these cases is to place the limb in its natural position; or, where that cannot be done, to reduce it as soon as may be into that position, and retain it there till such an alteration has taken place, as will preclude the probability of a relapse: the means which have been used to effect this are reducible to two kinds: 1st. By means of shoes with unequal soles, forcing the limb into its natural state. 2dly. Effecting the same purpose by means of leg-irons.

ALTHOUGH

ALTHOUGH the former plan has succeeded in some partial experiments, the general practice founded on them has by no means been successful. It is said, that when a person has the knee bending inwards, and the foot, in consequence, turned out of its natural direction, so that the outside edge touches the ground, if a shoe is put upon the foot, made with a sole twice as thick on the outside as it is on the inside, this will reverse its position, and, of course, reverse the position of the knee, and, by this means, remove the deformity.

WITHOUT absolutely denying this fact, it may be worth while to enquire if it is so general as to authorise us to depend upon it as a method of curing the disease. I have seen this method tried in numberless instances in children of every age at which this deformity makes its appearance, and have, in no one case, seen the least benefit derived from it. A gentleman, who is a surgeon in the army, tells me he has often known it succeed, when tried upon his recruits who have had legs distorted in this manner at the time they entered the service,
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and, in some instances, so bad that he had at first been almost tempted to dismiss them as unserviceable,

WHY, it may be asked, has not this method been successful in those cases where it has been tried under my observation, though upon patients at that period of life when it is admitted to be a curable disease, and, on the contrary, succeeded completely in adults, at which period, according to received opinions, it is supposed to be incapable of any alteration? As the determination of this question is certainly of some consequence, the present is, undoubtedly, the properest time to direct our enquiries towards it.

It is understood that the disease is debility in the ligaments of the joints, taking place in early infancy; if it is not cured it increases till the constitution acquires a certain degree of strength, it then becomes stationary, the distortion existing at this period remains, and the patient arrives at maturity under these circumstances, with as much strength, and capable of the same exertions

ertions as any other man: the disease is to be considered, at this time, as existing on account of rigidity of the ligaments which confine the bones in an improper direction; these ligaments are, at every period of life, capable of so much extension, by proper exertions, as will allow the bones of the leg to be removed into their natural state. Under these circumstances, an unequal sole is placed under the patient's foot, to direct it into a particular situation; he is obliged to walk many hours every day, in a manner that has most tendency to produce the same effect; and compelled, by every kind of stimulus, to exert all his strength in forcing his legs into the direction nature intended they should move in, and which they are still capable of doing, though not without much difficulty. Is it surprising that, when all the powers of the patient's body and mind are compelled by coercion, for a long time, to exert themselves in producing the intended effect, this effect in the end should be produced? But, let me ask, how much of this can be effected upon a child by the same means? for children are the proper subjects of these observations: their
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motions are, if I may be allowed the expression, spontaneous; they are neither conscious how they move, nor capable of regulating the motions of their limbs like the persons already mentioned, of course this system must be useless if practised upon them, if it did not, by twisting their limbs into improper directions, produce other deformities. The only means that can be used with success in curing such deformities in children, is by placing the distorted limb in such a situation as shall render it impossible to deviate from its natural situation by any motion of the patient, and adding such powers as shall be necessary to draw the parts into their natural state.

THIS, it is pretended, is done by the leg-irons commonly used, but with so little success, that although the disease in question is the simplest of those deformities to which the legs of children are liable, and, of course, ought to be the easiest cured, it is generally found as tedious when *any* progress is made in the cure, and almost as uncertain in the event as any of the more complex diseases for the cure of which such instruments are relied upon.

I HAVE

I HAVE already stated the objections to the general system upon which these instruments are constructed; in the present disease, these objections appear in the strongest point of view. The idea upon which they are constructed, with a view to cure this disease, is to place a strait iron on one side the leg, with joints correspondent to those in the knee and ankle; this is fixed to a shoe, and bound on the leg with straps, other straps are likewise added to bind the leg to the iron in a proper manner. It must be obvious, that a cure, in such case, can only be performed by keeping the limb, with the utmost exactness, in its proper position; a shoe cannot be fixed to the foot with so much exactness as is necessary to effect this, nor can the straps of such an iron be fixed round a leg so firmly as to produce the desired effect, without impeding the motion of the limb, and producing other bad consequences from their action as ligatures; the only alternative is to leave them so loose that none of these effects shall take place, in consequence of which, much of the benefit which might be expected from them

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cannot

cannot be obtained. If then we view the situation of a child with these instruments, we see him with a clumsy shoe and iron fastened loosely about his leg, in a manner more likely to act as a clog than remove his deformity: and, as this application is supposed to be so very simple, that it may be entrusted to a servant to arrange, along with the rest of the patient's dress, we need not be surprized at seeing children wear such things for two or three years, their friends contentedly supposing they are getting well, when, perhaps, little or no alteration has taken place during the whole of that time.

THE known tediousness of this method of treatment, even when it has been most successful, has suggested what has been called an improvement: this is to keep the patient in irons during the night; these irons are so constructed as to keep the legs extended at full length, and to bind them much tighter than they can be bound during the day-time, when the patient is in motion: as this practice has been sanctioned by some names of consequence, and very

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generally adopted, it certainly deserves a fair examination.

THE reasons given for its adoption are, that the inflection of the knees being most apparent when the legs are extended, and the patient being capable of bearing the bandages tighter while he is at rest than at any other time, the cure will be much accelerated by nocturnal bandage and extension of the legs: upon a cursory view of this argument, it may be allowed to possess all the force attributed to it; but, upon a closer inspection, there will be sufficient ground to form a different opinion: by keeping the legs extended in this manner for six or eight hours, the flexor muscles must be strained, and as forcible, permanent extension always creates debility, there is every reason to believe that the debility occasioned by this practice, is even more injurious to the patient than the original disease.

NONE of these inconveniencies can be produced by the elastic bandages I have substituted for these leg-irons: they are

always acting, while on the patient, it is true; their action may be encreased at pleasure, while he is not on his legs; but they are always acting on the limb in its natural state, whether in motion or at rest, and every motion of the limb encreases the action of the bandage, thus enabling the patient to take more exercise than he could take without it; and by this means, in every sense, accelerating the cure.

UPON recurring to the account already given of the nature of this disease, and the principles upon which it should be treated, it will be evident, that a cure can only be effected by placing the distorted limb (from the pelvis to the foot) in a situation as near to the natural state as its circumstances will admit, taking care that its natural motions shall be performed, without allowing it to deviate from the proper direction; to this must be added a power that shall draw the limb perfectly into its natural state. This is effected by substituting springs, properly adapted, for the strait iron used in the old system: in
order

order to do this, the natural and diseased action of the parts should be well understood; the compression produced by the bandages used, causes the spring to act in drawing the parts into their natural situation, and, by progressively tightening those bandages, the effect of that action may be progressively encreased to any degree required: this effect will likewise be encreased by the necessary motion of the limb encreasing the action of the spring; the attention requisite to direct these powers in such a manner as to ensure success, is, indeed, considerable; but, as they may be guided with certain and speedy effect to their desired end, as no other effectual mode of treatment has been adopted, there is every incentive to persevere in them, and no inconveniencies to be dreaded from their use.

It has been objected, *in theory*, that where there is action and re-action, as in the springs to be employed on this occasion, the parts acted upon will remain in their diseased state. In answer to this, it may be observed, the effect of my practice proves this objection has no foundation; but,

but, as I would not trust to an assertion while any thing like argument can be produced in its stead, I shall be excused for attempting to explain so much of the theory as will shew this objection is void of foundation.

THE force to be applied must be calculated to provide for three circumstances. 1st. To cure the inflection of the knees, supposing the patient to be in an incumbent posture: 2d. To produce the same effect while the weight of the body is super-added during the time he is in an erect posture: and 3d. To produce the same effect while he is in motion, and in an erect position.

It will be easily allowed, that the power which must be applied to produce the second effect, ought to be much greater than what will be necessary to answer the first, and what will be necessary to answer the third intention, must be greater than what is requisite for the second: if this last degree of force was applied, it certainly would be greater than the parts would bear; circulation of the fluids would be impeded,

impeded, and all the consequences of that impediment would ensue. This is precisely the case when common bandages or instruments, reducible to that principle, are fastened tight; hence the necessity of resorting to another principle, which is only to be found in the elastic bandage.

BUT the degree of force to be used in this method of treatment, should be so proportioned to all the circumstances of the case, that it should act in drawing the leg towards its natural state, so long as the patient is standing still in an erect posture, but yield when that exertion is added which is necessary to bend the leg; the springs, by yielding to this action of the limb, acquires the power of re-action when the former ceases; and this re-action, being greater than all the force then exerted against it, necessarily draws the distorted parts more towards their natural situation every time it is thus exerted: from all which it will appear, that, by this mode of treatment, the limbs, which, from debility, are unable to support the super-incumbent weight of the body, immediately

mediately acquire a degree of assistance, on the application of these bandages, which enables them to do so with ease: a degree of artificial strength, by which they are enabled to take so much exercise as will be the most effectual means of removing that debility which has occasioned the distortion, and which most effectually assists in removing that distortion itself.

It is many years since I first engaged in experiments upon this subject; I, very early, communicated my ideas respecting them to the late Mr. Hunter, and was stimulated to perseverance by his approbation: but barren approbation was not all the encouragement I received from him; he gave me many opportunities of reducing my principles to practice, and bore honorable testimony to my success on these occasions. From the many cases of this description I engaged in by his recommendation, I have selected the following, as tending to illustrate some of the principles laid down in the preceding pages.

CASE

C A S E V.

A DAUGHTER of — C —, Esq; aged three years, evidently of a very delicate constitution, though not unhealthy, had the left knee bent inwards as soon as she began to walk: this inflection increased rapidly, and in a short time the right began to take a similar direction. Mr. Hunter was consulted, and, thinking it a fair case to try the effect of my elastic bandages, referred it to me. As the right knee was much less bent than the left, it was thought advisable to try the bandage, at first upon the left only: in a short time the left became better, and the right, for want of equal support, the worst of the two; bandages were then applied to both legs, which were, by attentive management, soon brought into a state of equality; and, by means of this support, the child became remarkably active instead of being unwilling to move, and in about eight months her legs were perfectly straight.

R E M A R K S.

BESIDES what may be said of the celerity with which this cure was effected, in com-

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parison with what has taken place when the same disease has been treated in a different manner, some circumstances deserve our attention, which perhaps have frequently taken place in similar cases, though they have passed unnoticed.

It may be disputed whether the difference in the comparative degree of inflection of the two legs, took place in consequence of increase of curvature of one, or decrease of it in the other leg; it cannot, however, be disputed that this alteration took place because one was artificially supported, the other was not; for as soon as both were equally attended to, the cure proceeded equally well in each, and in due time there was no distortion remaining in either.

HAD this cure been left to the care of a common instrument-maker, or the attention of a nurse, it would, perhaps, have terminated very differently; to say nothing of the insufficiency of the methods adopted by such, and the chance that even these would have been misapplied, it
would

would most probably have been said that a long time must elapse before any benefit could have been expected, of course much time would have been wasted before it would have been suspected the child was getting worse; indeed the superiority of this method over every preceding one is peculiarly evident in this; the effect produced by *them*, if any thing is really effected, requires so much time, and is so doubtful as to leave it disputable whether it is the consequence of those methods, or of some effort of nature; while the celerity of the cure, performed by my method, proves, in the most satisfactory manner, that these diseases are, in their nature, as curable, and ought, therefore, to be as much the objects of professional attention as any other diseases to which mankind are liable.

C A S E VI.

SINCE these papers were put to the press, I was desired by Mr. Knight to visit the child of a person of high rank. She was about three years old, of a delicate consti-

tution, and not in very good health. The knees were so much bent inwards, that when she stood they almost crossed each other, the feet were more than seven inches asunder, and when she was laid straight on her back, were nearly in the same situation; the tibia in each leg was likewise bending forwards. As the curvature of the tibia was not encreasing, and the bend of the knees encreasing so fast, that she could scarcely walk, it was thought advisable to attend to that immediately, leaving the tibia until a future period.

I DIRECTLY applied the proper apparatus: in a fortnight I saw so much alteration as induced me to request the parents would examine her with Mr. Knight; they were unanimously of opinion that she was much better: the same plan was persevered in, and when she was examined a second time, which was six weeks after the first application, it was found, when the bandages were taken off and she laid on her back, that the legs fell perfectly into their natural direction, both the knees and feet touching each other when the legs were extended.

REMARKS.

R E M A R K S.

I do not mention this as a cure at present completed; though, I believe, not a doubt remains in the mind of any person concerned, that it will be perfected in a very short time; but I may be permitted to bring it forward as an unprecedented instance of celerity in removing a distortion of this kind, and a most uncontrovertible proof of the superior efficacy of my method of treating these diseases.

It is worthy of observation, that from the moment the apparatus was applied the child walked easily, with a firm step, and was desirous of being constantly on her feet: so far from feeling any restraint, she was immediately sensible of the benefit she received; for, I had once occasion to take them away two days to make alterations, and she was so sensible of the difference of her situation, that she would never afterwards suffer them to be out of her sight.

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IN the preceding pages, I have endeavoured to give a clear and concise idea of the most simple and most general of these distortions ; it remains to be observed, that others more complex in their nature and appearance, very frequently occur in practice ; these require treatment similar, in principle, to that which I have applied to those here described, but more complex, in proportion as the diseases are complicated of these or other deformities ; but of which no adequate idea can be conveyed in so imperfect an essay as this. I may be permitted to hope, that I have proved the method of treatment, I have endeavoured to explain, is more perfect than any that has been previously tried, yet I am perfectly sensible that there are cases in which no cure, or even palliation, can be expected, and in which all the benefit to be expected is to prevent them from growing worse by the use of common leg-irons. It is scarcely necessary to add, that in such cases care should be taken to have those instruments constructed upon the best principles, in order to avoid the disagreeable consequence frequently produced by them when made
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by ignorant workmen, and diminish, as much as possible, the inconveniencies which even the best constructed undoubtedly will occasion.

It may, perhaps, be remarked, that I have entered into no details respecting the forms of the instruments, the nature of the bandages, nor the mode of applying them in the treatment of these diseases; and such as are unwilling to assign a good motive while they can point out one of a contrary tendency, may insinuate, that I have declined this from an illiberal wish to withhold useful information, in order that I might secure the advantages resulting from it to myself: to such I might answer, that this invention is, in a peculiar manner, my own; that I have perfected it by experiments sedulously repeated for many years, and that what I have acquired with so much labour, I have a right to keep for my own advantage: such an answer would be perfectly justifiable; but, as I can assign much more laudable motives for adopting the line of conduct I pursue, I shall be excused

cused for here introducing a few observations on the subject.

THE opinions that have been formed pro and con on the question, whether mechanical applications are or can be useful in the treatment of these diseases, seem to have been adopted more *frequently as prejudices*, than in consequence of mature investigation of the subject: those who are friends to those applications, have seldom gone farther than to say, *get a leg-iron properly made*, make use of it, and the child will get well. A parent, furnished with such advice, seeks for the necessary article with the same train of ideas he would adopt in purchasing gloves, &c. The maker offers what his stock of information enables him to suggest, gives what are sometimes called directions for its use, and the business is done: the parent, perhaps, attends himself to the application of it, or possibly delegates that care to a servant; and after months, perhaps years, have elapsed, the child is no better than at first: those who have observed the progress of a few cases of this kind, immediately conclude

clude it is *ridiculous to make use of such things, because they have not known them do any good,* nor do they take the trouble to think the want of success in the instances they have observed, may have arisen from want of skill, or want of attention in the application, as well as from deficiency of power in the apparatus employed.

SIMPLE as the idea may be upon which the common leg-irons are constructed, it certainly requires more skill to apply them with propriety than can fall to the lot of any uninformed person, the first time such a case comes under their observation, which is the situation of most people, who undertake to manage such complaints in their own children : obvious as these principles may seem to be to the meanest capacity, nothing is more common than to use these instruments, applied in a manner that must inevitably increase, instead of removing the original disease, *because*, it is generally supposed they may be properly applied by directions from the workmen who make them : but, so far from this being the case, it is certain, that most of these people have

no knowledge of any disease for which they pretend to make instruments and what they do make is usually from patterns they have obtained by various ways: considering all these circumstances, is it surprizing, that so much mischief, or so little good is done by applications of this kind; for I am justified, by long observation, in saying, that of a given number of cases treated in this manner, few receive any benefit, but almost all either receive none, or are materially injured in consequence of it.

WHOEVER has considered the preceding pages with any attention, will be disposed to allow, that however rational or plausible the principles I have endeavoured to inculcate, may be, they cannot be carried into practice with success, except by some person who is well acquainted with the nature of the disease and structure of the parts concerned in it. Whoever is acquainted with these diseases must know they are subject to infinite variations in many circumstances from whence it happens, that no two cases have been known alike

alike in all their circumstances ; and, as a necessary consequence, it must be allowed, that no form can be given of instruments that shall be equally applicable to all cases. Principles may be explained, and, whoever will be at the trouble of examining them, will acquire the information necessary to practise them with success, provided they will try the proper experiments ; but had I inserted figures of the instruments used in curing the patients whose cases I have related, those who are unwilling or unable, as well as those who are capable of thinking properly on the subject, might have been tempted to try a method of treatment which has been found so successful ; the consequence would have been, that numerous instances would soon occur in which mischief would be done ; as a corroborating proof of this fact, I shall be excused for relating the following anecdote : Several years ago, while I was engaged in experiments on this subject, I mentioned them to a gentleman of the profession, whose name I will not disgrace, by publishing, on this occasion : he approved, and gave me several opportunities of trying them,

them, with success, in cases of inflected knees.

AFTER some time I observed he sent me no more patients, though I did not form any opinion as to the cause of this alteration, till some time afterwards I was informed, from unquestionable authority, that, *to serve another person, as it is called*, he had communicated my idea to him, though the poor creature had not sagacity to comprehend it.

I WAS consulted by a lady whose son had distorted legs; she told me she had consulted several persons, and, among others, the surgeon I allude to, who desired her to apply to Mr. ——— saying he was the most ingenious man in his profession, but she found what he had done had made the child much worse. I desired to see the things that had been used, and, to my great surprize, was shewn a bungling imitation of my own instruments. The particulars of the affair were these: the cases Mr ——— had seen under my care, were of the knees bending inwards; he had
given

given this man as correct a description as he could of the apparatus I made use of: in this case, the knees were bending outwards, but this *ingenious man* did not know this variation in the circumstances made it necessary that the power should be applied in a manner the reverse of what had been described to him; but, like a skilful and careful person, followed his instructions implicitly, and was thus, without knowing it, increasing the deformity he intended to relieve, and this would have been attributed to imperfection in the system of treatment, instead of the effects of inattention or ignorance.

THIS method of treatment has cost me too much application, and I am too well convinced of its success to suffer its reputation to be injured by injudicious use: I set up no claim to *secret nostrum*, but have endeavoured to explain the principles upon which it is founded, which is what every professional man ought to do when he performs any thing that may be serviceable to those who are afflicted with disease; I shall even be happy to hear that others adopt

adopt it with equal success; but I am certain that, in order to do this, obstacles must be overcome, that cannot be guarded against without much previous experience; by this, dearly earned, I have been enabled to determine with tolerable precision what may be done to alleviate most of those cases; I am, therefore, willing that the utility of the method of treatment explained in the preceding pages, shall be determined by the effects it will produce in my own hands, though I hope no one will be uncandid enough to form a hasty opinion of it, from what may *or may not be done with it by any* of those ignorant pretenders, who will undoubtedly be ready enough to make what they will call instruments upon my principles, as soon as it shall be proved the efficacy of those principles render them deserving of encouragement.

Description

*Description of the Patent Elastic Back Collar,
invented, made and sold only by
T. SHELDRAKE, No. 50, Strand,
Truss-Maker to the Westminster Hospital and
Mary-le-Bone Infirmary.*

AS it is generally known that the common collars have been emiently useful in correcting and preventing those improper habits which children are liable to contract, and which, if uncorrected, end in extreme deformity; and as the author of the elastic back collar has had the best opportunities of observing the imperfections of those collars now commonly in use, he, with confidence, begs leave to offer his own invention as a most important improvement in the construction of those machines.

THE idea upon which the common back collar is constructed is simple, *and just, as far as it goes*: it is intended, by keeping the body in one position, to prevent it from growing awry, or, when that effect has already taken place, the collar, being in itself even, is designed to restrain that part
which

which is grown out ; and, by this restraint, force it into its natural situation.

THE common collar, as may be easily demonstrated, is very defective : it must either be fastened so loose as to admit of the necessary motions of those parts it is fixed on, or so tight as to impede those motions : in the first case, much of the benefit that might be expected from a perfect instrument of this kind will not be obtained ; in the second, the wearer will sustain positive injury instead of deriving benefit from the use of them : too much restraint upon the arms will cause the circulation of the blood through them to be impeded, and too much restraint upon the body will render its motions uneasy, and lay the foundation of future deformity, instead of removing that which exists.

AN instrument, to answer all the purposes that are generally expected from the collar, should be so constructed as to prevent every improper action, and allow full liberty for the wearer to perform every natural one : this is perfectly effected by the
elastic

elastic back collar ; it is equal, perhaps superior in strength, and, in every case, weighs less than one-half, in many less than one-third of the common sort, and of equal size ; it is, therefore, less incumbrance to the wearer than that commonly in use ; and, while it effectually prevents or corrects those improper habits which children so frequently acquire, and so often are productive of extreme deformity, it is impossible, on account of its elasticity, to fasten it so tight as to become uneasy to the wearer, of course it cannot be productive of those bad effects which have been occasioned by the injudicious use of the common kind. Instead of restraining, it admits of performing all necessary actions with ease, and the effect intended to be produced by it is increased instead of being diminished by this means : if a person, wearing the common back collar, makes an exertion to extend the arms or bend the body, the strap checks the one, and the back, in great measure, prevents the other ; but the elastic back collar yields to those efforts ; and then, by the re-action of the spring, draws the

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parts

parts more forcibly into their natural situation: in short, its superiority is so evident, in many respects, that every person who has seen, has given it a decided preference over every other, and it is presumed that it will, in every instance, be proved the best, the most easy, and the most effectual invention that has ever been offered to the public.

N. B. It is requested that those purchasers of the elastic backs, who may wish to have any alterations made in them at a future time, will return them to the inventor for that purpose; as none of the common collar-makers are acquainted with the manner in which they are made, they would either spoil, by attempting to alter them, or attempt to conceal their ignorance, by saying, they could not be altered. The inventor engages to make any alterations in them that may be required at a future time.

PREPARING FOR THE PRESS.

AN ESSAY ON THE DISTORTED SPINE and DEFORMITIES connected with it; on the various methods adopted either with a view to prevention or cure; particularly a more effectual method of cure by means of a mechanical apparatus originally invented and recently much improved by

T. SHELDRAKE,

Truss-maker to the Westminster Hospital
and Mary-le-bone Infirmary.

THE introduction of Mr. le Vacher's spinal machine, by the late Mr. Reid, of Chelsea Hospital, near twenty years ago, and the pains taken by one Jones to recommend a similar apparatus, which, he pretended, was his own invention, naturally called the attention of professional men towards improvements in the methods of treating the distorted spine. The theory upon which this machine was constructed, was, indeed, sufficiently specious; and, as nothing better was then known, obtained very general notice, though, in fact, it was liable to many solid objections.

I was at that time in attendance on the late Dr. Hunter, Mr. Cruikshank and Mr. John Hunter, where I became acquainted with facts respecting the structure of the body and the animal economy, which convinced me this spinal machine was not only inefficient in its fundamental principles, but might be, in various ways, injurious to the wearer; after many experiments, I invented an apparatus more efficient in its principles, and not liable to any of the objections jointly made to the other; of this machine, I published a description, of which the following account was given in the Critical Review :

“MR. SHELDRAKE, who unites a competent knowledge of anatomy to his mechanical abilities as an instrument-maker, endeavours to recommend an improved instrument to remove distortions of the spine. Mr. Jones, some years since, proposed an instrument, which was very similar to one formerly described by Mr. le Vacher of the French Academy, without acknowledging its original, though it was probably borrowed from Mr. le Vacher. This
machine

machine frequently failed; and we must own, that we should, in such cases, rather prefer 'the ills we have—than fly to others that we know not of.' The improved instrument by Mr. Sheldrake is certainly free from many of the inconveniencies of that of Jones; and we are convinced, from other reasons, besides those employed in the present pamphlet, that it can have no effect in distorting the pelvis. It may therefore be cautiously used, though it ought always to be laid aside, if it give the least pain: its principles are rational, and its execution is generally proper. We need not inform our readers, that Mr. Pott has only proposed a method of curing the paralysis of the lower extremities, without any means of removing the distortion. He seems to think that it should remain; but Mr. Sheldrake is of opinion, that its removal may be safely attempted by his machine; and, with the restrictions just mentioned, we can see little objection to it."—
CRITICAL REVIEW.

As I was desirous of making it as perfect as possible, the many cases this publication brought

brought under my observation enabled me to become acquainted with facts which led to farther improvements in this method of treatment; these improvements, during the course of twelve years, have been so many, that the instrument, of which the preceding account was given, although more perfect than any thing of the kind that had been made public before it, is extremely imperfect when compared with that I now use.

I HAVE been repeatedly asked for a new edition of my Essay on the distorted Spine, and deferred publishing it because I was constantly making additions to it, which, in fact, will now make it a new book. As it may be sometime before my other avocations will suffer me to print it, it appears advisable that I should at present mention, that my spinal machine is, in its improved state, so much superior to my original one, that I have known it produce more effect in two months than the other did in twelve; as the long trial le Vacher's has experienced in England, has proved it to be always inefficacious and frequently injurious.

ous, and as my improved apparatus cannot possibly do harm on any occasion, I may, without presumption, recommend it to the notice of those who may have occasion for assistance of that kind, as the most effectual means of removing distortions of the spine that has hitherto been known.

